Center Independent Research & Development: GSFC IRAD

Gigabit Per Second Data Processing

Completed Technology Project (2012 - 2014)

Project Introduction

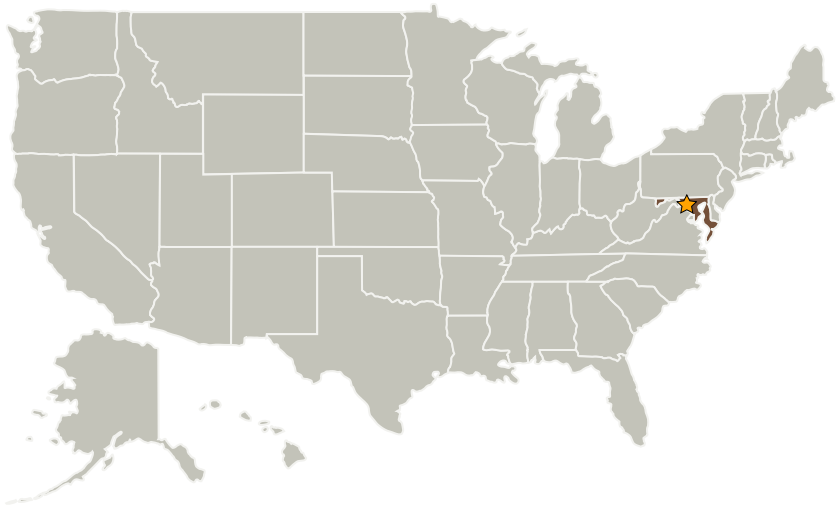
Solve the existing problem of handling the on-board, real time, memory intensive processing of the Gb/s data stream of the scientific instrument. Examine and define the high data rate processing equipment and parallel processing methods needed to support the short-term and long-term development of the scientific instrument.

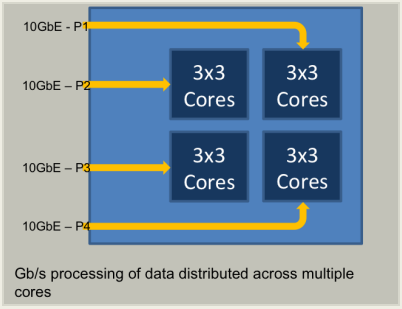
The multi-core processor supports several operating systems including state of the art multiprocessing operating systems, such as Linux SMP, and use ANSI C/C++ allowing existing code to be easily integrated. We will evaluate and implement existing techniques to streamline our data processing system. We will perform benchmark tests (or timing tests) to evaluate our improvements in processing speed needed to solve the problem. Our goal is to embed the processor in the on-board electronics, therefore, we must determine the smallest number of cores that provide sufficient processing capabilities compatible with the power resources of the balloon experiment and low earth orbiting satellite.

Anticipated Benefits

N/A

Primary U.S. Work Locations and Key Partners





Gb/s processing of data distributed across multiple cores

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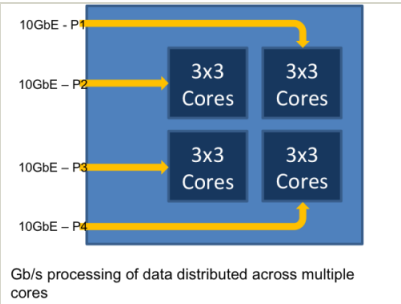
Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations
Maryland

Images



Gb/s processing of data distributed across multiple cores

Gigabit Per Second Data Processing Project
Gb/s processing of data distributed across multiple cores
(https://techport.nasa.gov/image/4015)

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

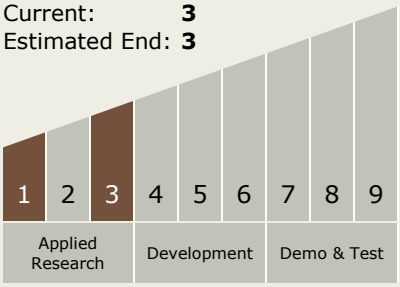
Program Manager:
Peter M Hughes

Project Manager:
Jacqueline J Le Moigne-stewart

Principal Investigator:
Teresa B Sheets

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX02 Flight Computing and Avionics
  - TX02.1 Avionics Component Technologies
    - TX02.1.3 High Performance Processors